

Abstract Submitted  
for the APR15 Meeting of  
The American Physical Society

**Search for the standard model Higgs boson with mass  $\sim 125$  GeV in the  $H \rightarrow WW \rightarrow lvjj$  channel at CMS** JOSEPH GOODELL, Univ of Virginia, CMS COLLABORATION — One of the biggest recent successes of the standard model (SM) was the 2012 discovery of a new scalar particle consistent with a SM-like Higgs boson by the CMS and ATLAS experiments at the Large Hadron Collider (LHC). The production of Higgs particles and their subsequent decay allows many distinct final states to be observed. Presented here is a search for a SM Higgs boson with mass  $\sim 125$  GeV that decays through two W bosons, where one W decays hadronically and the other leptonically. While  $H \rightarrow WW$  has been observed at the LHC in the fully-leptonic final state, analyses in the  $lvjj$  channel have not yet achieved sufficient sensitivity to a low-mass Higgs. This analysis was optimized directly for a low-mass Higgs boson and aims to complement the observations of the Higgs in this regime. The decay chain  $H \rightarrow WW \rightarrow lvjj$  requires one W boson to have an off-shell mass; further, the presence of a neutrino in the final state makes Higgs mass reconstruction difficult. Lastly, this decay channel suffers from a large irreducible background from W+jets production. Multivariate techniques have been explored for signal extraction. This talk describes a boosted decision tree approach, focusing on the 2012 8 TeV proton-proton collision data collected at CMS.

Joseph Goodell  
Univ of Virginia

Date submitted: 07 Jan 2015

Electronic form version 1.4